DOCKET SECTION

BEFORE THE
POSTAL RATE COMMISSION
WASHINGTON, D.C. 20268-0001

Postal Rate and Fee Changes, 1997) Docket No. R97-1

OFFICE OF THE CONSUMER ADVOCATE
INTERROGATORIES TO UNITED STATES POSTAL SERVICE
(OCA/USPS-119)
November 14, 1997

Pursuant to sections 25 and 26 of the Rules of Practice of the Postal Rate Commission, Special Rule 2.E. and, to the extent applicable, Commission Order No. 1201 and rulings of the Presiding Officer, the Office of the Consumer Advocate ("OCA") hereby submits interrogatories and requests for production of documents. Instructions included with OCA interrogatories 1-7 to the United States Postal Service dated July 16, 1997, are hereby incorporated by reference.

Respectfully submitted,

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OCA/USPS-119. These interrogatories refer to the program SPBSP in Library Reference H-149 and include two attachments numbered 4 and 5 to distinguish them from attachments to recent interrogatories, OCA/USPS-107-118, related to the same library references. Attachment 4 is the program log of the program execution for SPBSP. In order to run on a PC, the program was changed with the addition of one new line of code, line 51 of Attachment 4, to identify the location of the input data base in Library Reference H-148. Attachment 5 is the SPBSP program output developed with the new line of code.

a. Please confirm that the one new line of code, line 51, permits correct identification of the input data base. If you are unable to confirm, please explain.

b. Please confirm that the output on Attachment 5 for SPBSP does not replicate the output for SPBSP found in WP-1, USPS Workpapers, Estimation of Econometric Equations for MODS Direct Activities, Docket No. R97-1, Michael D. Bradley, USPS-T-14. If you do not confirm, please explain.

c. Attachment 4, the program log, appears to list a number of errors in the program execution. As indicated in part a, above, except for the addition of one new line of code, the program is identical to the SPSBS program in Library Reference H-148. Please confirm that by line 115 in the program log of Attachment 4 data are missing from certain data sets and that meaningful results can not be obtained. If you do not confirm, please explain.

d. Please identify any lines of code in Attachment 4 which should be changed, including line number and necessary adjustments, to permit execution of the program and to replicate the results in the workpapers.

```
1   ************************************************************************;
2   *** THIS PROGRAM ESTIMATES THE VARAIBILITIES FOR MAIL PROCESSING LABOR   ;
3   *** THE PROGRAM HAS FIVE PARTS                                           ;
4   ***                                                                      ;
5   *** PART I OF THIS PROGRAM READS IN THE DATA, SELECTS THE OPERATION TO   ;
6   *** BE ESTIMATED AND CREATES THE TIME TREND AND SEASONAL VARIABLES        ;
7   ***                                                                      ;
8   *** PART II CREATES THE LAGGED VALUE FOR TPH FOR EACH SITE.  BECAUSE OF  ;
9   *** THE PANEL NATURE OF THE DATA THE LAGGING                             ;
10  *** MUST BE DONE SEPARATELY FOR EACH SITE                                ;
11  ***                                                                      ;
12  *** PART III MEAN CENTERS THE DATA & CALCULATES THE INFORMATION REQUIRED ;
13  *** FOR THE GNR AND HAUSMAN  TESTS                                       ;
14  ***                                                                      ;
15  *** PART IV ESTIMATES THE FIXED EFFECTS MODEL WITHOUT A SERIAL           ;
16  *** CORRELATION CORRECTION, CALULATES THE BFN DURBIN WATSON,             ;
17  *** AND THE BLI RHO                                                      ;
18  ***                                                                      ;
19  *** PART V ESTIMATES THE FIXED EFFECTS MODEL WITH THE SERIAL CORRELATION ;
20  *** CORRECTION IN PLACE.                                                 ;
21  ************************************************************************;
22
23  *%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%;
24  * PART I:  THIS SECTION OF THE PROGRAM  READS IN THE DATA,                 ;
25  * SELECTS THE OPERATION TO BE ESTIMATED AND CREATES THE                    ;
26  * TIME TREND AND SEASONAL VARIABLES                                       ;
27  * THE INPUT VARIABLES ARE DEFINED AS FOLLOWS:                             ;
28  * THE    T' PREFIX REFERS TO TPH AND THE  H' PREFIX REFERS TO HOURS       ;
29  * THE REMAING PORTIONS OF THE VARIABLE NAMES HAVE THE FOLLOWING DEFNS     ;
30  * OCR         - OCR OPERATION;
31  * BCS         - BCS OPERATION;
32  * LSM         - LSM OPERATION;
33  * MANL            - MANUAL LETTER OPERATION;
34  * MANF        - MANUAL FLAT OPERATION;
35  * FSB         - FSM OPERATION;
36  * MANP        - MANUAL PARCEL OPERATION;
37  * MECALLP         - MECHANIZED PARCEL OPERATION;
38  * SPBALLP         - SPBS NON-PRIORITY OPERATION;
39  * MANPRIO         - MANUAL PRIORITY OPERATION;
40  * SPBPRIO         - SPBS PRIORITY OPERATION;
41  * IN ADDITION, MANR IS THE MANUAL LETTER RATIO AND MANFR IS THE
42  * MANUAL FLAT RATIO;
43  *%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%;
44  ************************************************************************;
45
46
47  ************Modification to import database from LIBREF*********;
48  ************Program is SPBSP in LIBREF 149**********************;
```

```
49   ************************************************************************;
50
51   filename tre 't:\r97-1\libref\h-148\vvmpo.dat';
52
53   ********************End of OCA Modification*****************************;
54   ************************************************************************;
55
56
57   DATA OPSTAGE; INFILE TRE;
58   INPUT IDNUM FYAP TOCR HOCR TBCS HBCS
59   TLSM HLSM TMANL HMANL TMANF HMANF
60   TFSB HFSB TMANP HMANP TMECALLP HMECALLP TSPBALLP HSPBALLP
61   TMANPRIO HMANPRIO TSPBPRIO HSPBPRIO
62   TCANP HCANP
63   MANR MANFR;
64   ************************************************************************;
65   *** THIS CODE DOUBLE CHECKS THE ELIMINATION OF DATA BEFORE 8801  ***;
66   *** AND AFTER 9613                                              ***;
67   ************************************************************************;

NOTE: The infile TRE is:
      FILENAME=t:\r97-1\libref\h-148\vvmpo.dat,
      RECFM=V,LRECL=256

NOTE: 30828 records were read from the infile TRE.
      The minimum record length was 59.
      The maximum record length was 187.
NOTE: The data set WORK.OPSTAGE has 30828 observations and 28 variables.
NOTE: The DATA statement used 14.66 seconds.


68   DATA OPSTAGE; SET OPSTAGE;
69   IF FYAP LT 8801 THEN DELETE;
70   IF FYAP GT 9613 THEN DELETE;
71   ************************************************************************;
72   *** AT THIS POINT THE PROGRAM DEFINES THE OPERATION TO BE ESTIMATED ***;
73   ************************************************************************;

NOTE: The data set WORK.OPSTAGE has 30828 observations and 28 variables.
NOTE: The DATA statement used 3.95 seconds.


74   DATA OPER; SET OPSTAGE;
75   TPH=TSPBPRIO;
76   HRS=HSPPRIO;
77   TITLE1 ' SPBS PRIORITY         OPERATIONS/ HOURS ON TPH';
78   TITLE2 'USING ONLY CONTINUOUS DATA FROM 8801-9613';
79   TITLE3 'INCLUDING OFFICES @ LEAST 39 OBS/LAG MODEL';
80   TITLE4 'USES 12 AP DUMMIES TO CAPTURE SEASONAL EFFECTS';
81   ************************************************************************;
82   *** ELIMINATING UNUSED VARIABLES TO SAVE SPACE                     ***;
83   ************************************************************************;

NOTE: Variable HSPPRIO is uninitialized.
```

```
NOTE: The data set WORK.OPER has 30828 observations and 31 variables.
NOTE: The DATA statement used 4.16 seconds.

84   DATA OPER; SET OPER;
85    KEEP IDNUM FYAP TPH HRS ;
86   ************************************************************************;
87   *** ELIMINATING DATA WITH MISSING TPH OR HRS                          ***;
88   ************************************************************************;

NOTE: The data set WORK.OPER has 30828 observations and 4 variables.
NOTE: The DATA statement used 1.6 seconds.


89     DATA OPER MISSING;
90     SET OPER;
91     IF TPH=. OR TPH=0 OR HRS=. OR HRS=0 OR HRS<0
92     THEN OUTPUT MISSING;
93     ELSE OUTPUT OPER;
94   ************************************************************************;
95   *** THIS WORK FILE NO LONGER NEEDED AND IS ELIMINATED TO SAVE SPACE ***;
96   ************************************************************************;

NOTE: The data set WORK.OPER has 0 observations and 4 variables.
NOTE: The data set WORK.MISSING has 30828 observations and 4 variables.
NOTE: The DATA statement used 1.15 seconds.


97   PROC DATASETS LIBRARY=WORK;
                                    -----Directory-----

                              Libref:         WORK
                              Engine:         V612
                              Physical Name: C:\SAS\SASWORK\#TD91087

                                   #  Name     Memtype  Indexes
                                   ---------------------------
                                   1  MISSING  DATA
                                   2  OPER     DATA
                                   3  OPSTAGE  DATA
98   DELETE OPSTAGE;

NOTE: Deleting WORK.OPSTAGE (memtype=DATA).
NOTE: The PROCEDURE DATASETS used 0.59 seconds.


99   DATA OPER;SET OPER;
100  ************************************************************************;
101  *** TO CHECK FOR DATA SUFFICIENCY THE PROGRAM IDENTIFIES              ***;
102  *** THE NUMBER OF OBS. PER SITE                                      ***;
103  ************************************************************************;

NOTE: The data set WORK.OPER has 0 observations and 4 variables.
NOTE: The DATA statement used 0.22 seconds.
```

```
104  PROC MEANS NOPRINT;
105  BY IDNUM;
106  VAR TPH;
107  OUTPUT OUT=OUT1 N=N;

NOTE: No observations in data set WORK.OPER.
NOTE: The data set WORK.OUT1 has 0 observations and 4 variables.
NOTE: The PROCEDURE MEANS used 0.44 seconds.


108     PROC SORT; BY IDNUM;
109  ************************************************************************;
110  * ELIMINATING ANY SITES THAT DO NOT HAVE 39 OBS                         ;
111  ************************************************************************;

NOTE: Input data set is empty.
NOTE: The data set WORK.OUT1 has 0 observations and 4 variables.
NOTE: The PROCEDURE SORT used 0.22 seconds.


112  DATA OPER; MERGE OPER OUT1; BY IDNUM ;

NOTE: The data set WORK.OPER has 0 observations and 7 variables.
NOTE: The DATA statement used 0.17 seconds.


113     DATA MODSET; SET OPER;

NOTE: The data set WORK.MODSET has 0 observations and 7 variables.
NOTE: The DATA statement used 0.11 seconds.


114     DATA OPER SHORT; SET MODSET;
115     IF N< 39 THEN OUTPUT SHORT;
116     IF N > 38 THEN  OUTPUT OPER;

NOTE: The data set WORK.OPER has 0 observations and 7 variables.
NOTE: The data set WORK.SHORT has 0 observations and 7 variables.
NOTE: The DATA statement used 0.22 seconds.


117     PROC SORT DATA=OPER; BY IDNUM;

NOTE: Input data set is empty.
NOTE: The data set WORK.OPER has 0 observations and 7 variables.
NOTE: The PROCEDURE SORT used 0.11 seconds.


118  PROC DATASETS LIBRARY=WORK;
                                    -----Directory-----

                             Libref:         WORK
```

```
                    Engine:        V612
                    Physical Name: C:\SAS\SASWORK\#TD91087

                         #  Name     Memtype  Indexes
                         ---------------------------
                         1  MISSING  DATA
                         2  MODSET   DATA
                         3  OPER     DATA
                         4  OUT1     DATA
                         5  SHORT    DATA
119  DELETE MODSET;

NOTE: Deleting WORK.MODSET (memtype=DATA).
NOTE: The PROCEDURE DATASETS used 0.27 seconds.


120     DATA OPER; SET OPER;
121    IF FYAP GT 9613 THEN DELETE;

NOTE: The data set WORK.OPER has 0 observations and 7 variables.
NOTE: The DATA statement used 0.22 seconds.


122    DATA OPER; SET OPER;
123  ************************************************************;
124  ***      SETTING UP THE TIME TREND VARIABLES              ***;
125  ************************************************************;
126  IF FYAP LE 8813 THEN TIME1=FYAP-8801+1;
127  IF FYAP GE 8901 THEN TIME1=FYAP-8901+14;
128  IF FYAP GE 9001 THEN TIME1=FYAP-9001+27;
129  IF FYAP GE 9101 THEN TIME1=FYAP-9101+40;
130  IF FYAP GE 9201 THEN TIME1=FYAP-9201+53;
131  IF FYAP GE 9301 THEN TIME1=0;
132  IF FYAP GE 9401 THEN TIME1=0;
133  IF FYAP GE 9501 THEN TIME1=0;
134  ************************************************************;
135  IF FYAP LE 8813 THEN TIME2=0;
136  IF FYAP GE 8901 THEN TIME2=0;
137  IF FYAP GE 9001 THEN TIME2=0;
138  IF FYAP GE 9101 THEN TIME2=0;
139  IF FYAP GE 9201 THEN TIME2=0;
140  IF FYAP GE 9301 THEN TIME2=FYAP-9301+1;
141  IF FYAP GE 9401 THEN TIME2=FYAP-9401+14;
142  IF FYAP GE 9501 THEN TIME2=FYAP-9501+27;
143  IF FYAP GE 9601 THEN TIME2=FYAP-9601+40;
144  ************************************************************;
145  *** CREATING THE SEASONAL DUMMY VARIABLES                 ***;
146  ************************************************************;
147  IF MOD(FYAP,100)=1 THEN AP01=1; ELSE AP01=0;
148  IF MOD(FYAP,100)=2 THEN AP02=1; ELSE AP02=0;
149  IF MOD(FYAP,100)=3 THEN AP03=1; ELSE AP03=0;
150  IF MOD(FYAP,100)=4 THEN AP04=1; ELSE AP04=0;
151  IF MOD(FYAP,100)=5 THEN AP05=1; ELSE AP05=0;
152  IF MOD(FYAP,100)=6 THEN AP06=1; ELSE AP06=0;
```

```
153  IF MOD(FYAP,100)=7 THEN AP07=1; ELSE AP07=0;
154  IF MOD(FYAP,100)=8 THEN AP08=1; ELSE AP08=0;
155  IF MOD(FYAP,100)=9 THEN AP09=1; ELSE AP09=0;
156  IF MOD(FYAP,100)=10 THEN AP10=1; ELSE AP10=0;
157  IF MOD(FYAP,100)=11 THEN AP11=1; ELSE AP11=0;
158  IF MOD(FYAP,100)=12 THEN AP12=1; ELSE AP12=0;
159  IF MOD(FYAP,100)=13 THEN AP13=1; ELSE AP13=0;
160  ************************************************************************;
161  *** DETERMINING THE NUMBER OF OBS FOR EACH SITE (USED LATER IN THE ***;
162  *** MATRIX MANIPULATIONS).                                          ***;
163  ************************************************************************;

NOTE: The data set WORK.OPER has 0 observations and 22 variables.
NOTE: The DATA statement used 0.97 seconds.


164  PROC SORT; BY IDNUM FYAP;

NOTE: Input data set is empty.
NOTE: The data set WORK.OPER has 0 observations and 22 variables.
NOTE: The PROCEDURE SORT used 0.11 seconds.


165  PROC MEANS NOPRINT;
166  BY IDNUM; VAR TPH;
167  OUTPUT OUT=NOUT N=N;
168
169  *%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%;
170  *** PART II: USING PROC IML TO CREATE THE LAGGED DATA                     ;
171  *** THE LAGGING MUST BE DONE SEPARATELY FOR EACH SITE BECAUSE OF THE      ;
172  *** PANEL NATURE OF THE DATA.  ONCE THE LAGS ARE MADE FOR EACH SITE       ;
173  *** THEY ARE HORIZONTIALLY CONCATINATED WITH THE OTHER VARIABLES          ;
174  *** THE DATA FOR ALL SITES ARE THEN VERTICALLY CONCATINATED TO            ;
175  *** RECONSTRUCT THE PANEL DATA SET                                        ;
176  *%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%;
177  *          **** START OF PROC IML *******;

NOTE: No observations in data set WORK.OPER.
NOTE: The data set WORK.NOUT has 0 observations and 4 variables.
NOTE: The PROCEDURE MEANS used 0.33 seconds.


178   PROC IML;
IML Ready
179   RESET AUTONAME ;
180   START MAIN;
181     USE NOUT VAR {N};
181                                  * READING IN THE # OF OBS PER SITE;
182     READ ALL INTO NN ;
182                                  * N IS NUMBER OF OBS PER SITE;
183     *THE NEXT LINE READS IN DATA FOR THE RHS;
184     USE OPER VAR {IDNUM FYAP TPH TIME1 TIME2 AP02 AP03 AP04
185     AP05 AP06 AP07 AP08 AP09 AP10 AP11 AP12 AP13  };
186     READ ALL INTO RZ ;
```

```
USE OPER VAR  {HRS};
                        * READING IN THE DATA FOR THE DEP VAR;
READ ALL INTO RY ;
K1= NCOL(RZ);
                        * Z AND K1 ARE FOR INTERCEPT FORM;
NT= NROW(RY);
                        * NT IS TOTAL NUMBER OF OBS.;
N=NROW(NN);
K2=K1+1;
AUGZ=J(1,K2,{0});
                  AUGY=J(1,1,{0});
                                    *ESTABLISH PLACEHOLDERS;
IN1=0;
       IN2=0;
                                *INITIALIZE POINTERS FOR LAGGING;
DO S = 1 TO N BY 1;
TL=NN(|S,|);
                                *TL IS NUMBER OF RECORDS FOR A SITE;
IN1=1 + IN2;
              IN2= TL + IN2;
INYD1=IN1+1;
              INYD2=IN2-1;
CZ1=RZ(|INYD1:IN2,|);
                                *SECOND OB. THROUGH LAST OB.;
LZ1=RZ(|IN1:INYD2,3|);
                                *FIRST OB. THROUGH SECOND LAST OB.;
CY1=RY(|INYD1:IN2,|);
                                *SECOND OB. THROUGH LAST OB.;
AUGY1=CY1;
AUGZ1=CZ1||LZ1;
                                *HORIZONTAL CONCATINATON  OF MATRIX;
AUGZ=AUGZ//AUGZ1;
                                *VERTICAL CONCATINATION OF MATRIX;
AUGY=AUGY//AUGY1;
END;
NTS=NT-N;
          NTS1=NTS+1;
                             *NUMBER OF OBS DECREASED BY 1 PER SITE;
AUGZ=AUGZ(|2:NTS1,|);
                             *REMOVE PLACEHOLDER OBSERVATION;
AUGY=AUGY(|2:NTS1,|);
Z =AUGZ;
         Y=AUGY;
NEW=AUGY||AUGZ;
                             * COMBINE LHS AND RHS VARIABLES;
VARN={'HRS' 'IDNUM' 'FYAP' 'TPH'
'TIME1' 'TIME2' 'AP02' 'AP03' 'AP04' 'AP05' 'AP06'
'AP07' 'AP08' 'AP09' 'AP10' 'AP11' 'AP12' 'AP13'
'TPH1' };
                   *WRITING OUT THE NEW DATA SET;
CREATE LAGSET FROM NEW (|COLNAME=VARN|);
APPEND FROM NEW;
SETOUT LAGSET;
CLOSE LAGSET;
```

```
220     FREE K1 AUGZ AUGY IN1 IN2 CZ1 LZ1 CY1 INYD1
221          INYD2;
221                * ELIMINATING UNUSED VARIABLES TO SAVE SPACE;
222   FINISH MAIN;
NOTE: Module MAIN defined.
223   RUN MAIN;
WARNING: Data set WORK.NOUT is empty.

 statement : USE             at line   181 column   4
 traceback : module MAIN     at line   181 column   4
WARNING: End of File reached.

 statement : READ            at line   182 column   4
 traceback : module MAIN     at line   182 column   4
WARNING: Data set WORK.OPER is empty.

 statement : USE             at line   184 column   4
 traceback : module MAIN     at line   184 column   4
WARNING: End of File reached.

 statement : READ            at line   186 column   4
 traceback : module MAIN     at line   186 column   4
WARNING: Data set WORK.OPER is empty.
NOTE: Reopening data set WORK.OPER.
WARNING: Data set WORK.OPER is empty.

 statement : USE             at line   187 column   4
 traceback : module MAIN     at line   187 column   4
WARNING: End of File reached.

 statement : READ            at line   188 column   4
 traceback : module MAIN     at line   188 column   4
ERROR: (execution) Invalid subscript or subscript out of range.

 operation : (|       at line   208 column  13
 operands  : AUGZ, *LIT1019, NTS1,

AUGZ          1 row       1 col     (numeric)

         0

*LIT1019      1 row       1 col     (numeric)

         2

NTS1          1 row       1 col     (numeric)

         1

 statement : ASSIGN          at line   208 column   4
 traceback : module MAIN     at line   208 column   4
NOTE: Paused in module MAIN.
224   ******* END OF PROC IML PROCEDURE TO CREATE LAG TPH ***********;
Exiting IML.
```

```
NOTE: The PROCEDURE IML used 2.52 seconds.

      PROC DATASETS LIBRARY=WORK;
                                        -----Directory-----

                              Libref:         WORK
                              Engine:         V612
                              Physical Name: C:\SAS\SASWORK\#TD91087

                                   #  Name      Memtype  Indexes
                                   ----------------------------
                                   1  MISSING   DATA
                                   2  NOUT      DATA
                                   3  OPER      DATA
                                   4  OUT1      DATA
                                   5  SHORT     DATA
      DELETE OPER; *DELETE WORK DATASET TO SAVE SPACE;
      ;
     *%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%;
     ** PART III: MEAN CENTERING THE DATA, CALCULATING THE                   ;
     ** INFORMATION REQUIRED FOR THE GNR AND THE HAUSMAN  TEST               ;
     *%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%;

NOTE: Deleting WORK.OPER (memtype=DATA).
NOTE: The PROCEDURE DATASETS used 0.33 seconds.


     PROC MEANS DATA=LAGSET;
ERROR: File WORK.LAGSET.DATA does not exist.
         VAR TPH TIME1 TIME2 HRS;
         OUTPUT OUT=MOUT1 MEAN=MTPH MTIME1 MTIME2 MHRS;
     ********************************************************************;
     * THIS SECTION MEAN CENTERS THE DATA, TAKES LOGS, AND FORMS THE     *;
     * SQUARES AND CROSS PRODUCTS FOR THE REGRESSIONS                    *;
     ********************************************************************;

NOTE: The SAS System stopped processing this step because of errors.
WARNING: The data set WORK.MOUT1 may be incomplete.  When this step was stopped there were 0
         observations and 0 variables.
NOTE: The PROCEDURE MEANS used 0.2 seconds.



      DATA OPER1;
        IF _N_=1 THEN SET MOUT1;    SET LAGSET;
ERROR: File WORK.LAGSET.DATA does not exist.
        TPH=TPH/MTPH;
        TPH1=TPH1/MTPH;
        HRS=HRS/MHRS;
        TPH=LOG(TPH);
        TPH1=LOG(TPH1);
        HRS=LOG(HRS);
        TPH2=TPH*TPH;
```

```
248     TPH21=TPH1*TPH1;
249   TIME1=TIME1-MTIME1;
250   TIME12=TIME1*TIME1;
251   TIM1TPH=TIME1*TPH;
252   TIME2=TIME2-MTIME2;
253   TIME22=TIME2*TIME2;
254   TIM2TPH=TIME2*TPH;

NOTE: The SAS System stopped processing this step because of errors.
WARNING: The data set WORK.OPER1 may be incomplete.  When this step was stopped there were 0
         observations and 15 variables.
NOTE: The DATA statement used 0.39 seconds.



255   PROC DATASETS LIBRARY=WORK;
                                      -----Directory-----

                                Libref:         WORK
                                Engine:         V612
                                Physical Name: C:\SAS\SASWORK\#TD91087

                                     #  Name      Memtype  Indexes
                                     ---------------------------
                                     1  MISSING   DATA
                                     2  MOUT1     DATA
                                     3  NOUT      DATA
                                     4  OPER1     DATA
                                     5  OUT1      DATA
                                     6  SHORT     DATA
256   DELETE LAGSET MISSING MOUT1 OUT1 SHORT TEMP ;

NOTE: The file WORK.LAGSET (memtype=DATA) was not found, but appears on a DELETE statement.
NOTE: The file WORK.TEMP (memtype=DATA) was not found, but appears on a DELETE statement.
NOTE: Deleting WORK.MISSING (memtype=DATA).
NOTE: Deleting WORK.MOUT1 (memtype=DATA).
NOTE: Deleting WORK.OUT1 (memtype=DATA).
NOTE: Deleting WORK.SHORT (memtype=DATA).
NOTE: The PROCEDURE DATASETS used 0.39 seconds.


257   DATA OPER1; SET OPER1;

NOTE: The data set WORK.OPER1 has 0 observations and 15 variables.
NOTE: The DATA statement used 0.17 seconds.


258   PROC SORT; BY IDNUM FYAP;
ERROR: Variable IDNUM not found.
ERROR: Variable FYAP not found.

NOTE: The SAS System stopped processing this step because of errors.
NOTE: The PROCEDURE SORT used 0.22 seconds.
```

```
259    PROC MEANS NOPRINT;
260    BY IDNUM;  VAR TPH;
ERROR: Variable IDNUM not found.
261    OUTPUT OUT=NOUT N=N;
262  ************************************************************************;
263  *** GENERATING THE OLS RESIDUALS FOR USE IN THE GNR REGRESSIONS  ***;
264  *** RUNNING THE GNR REGRESSION AND TESTING FOR THE SIGNIFCANCE   ***;
265  *** OF SITE SPECIFIC EFFECTS                                    ***;
266  ************************************************************************;

NOTE: The SAS System stopped processing this step because of errors.
WARNING: The data set WORK.NOUT may be incomplete.  When this step was stopped there were 0
         observations and 0 variables.
WARNING: Data set WORK.NOUT was not replaced because this step was stopped.
NOTE: The PROCEDURE MEANS used 0.28 seconds.



267  PROC REG DATA=OPER1;
268  MODEL HRS = TPH TPH2 ;
269  OUTPUT OUT=OLSEPS R=ORESID;

NOTE: No observations in data set WORK.OPER1.
NOTE: The data set WORK.OLSEPS has 0 observations and 0 variables.
NOTE: The PROCEDURE REG used 0.33 seconds.


270  PROC SORT DATA=OLSEPS; BY IDNUM;
ERROR: Variable IDNUM not found.

NOTE: The SAS System stopped processing this step because of errors.
NOTE: The PROCEDURE SORT used 0.05 seconds.



271   PROC MEANS NOPRINT DATA=OLSEPS; BY IDNUM;
ERROR: Variable IDNUM not found.
272   VAR ORESID;
273   OUTPUT OUT=IDEPS MEAN=PORESID;

NOTE: The SAS System stopped processing this step because of errors.
WARNING: The data set WORK.IDEPS may be incomplete.  When this step was stopped there were 0
         observations and 0 variables.
NOTE: The PROCEDURE MEANS used 0.16 seconds.



274   DATA RCROSS; MERGE OLSEPS IDEPS; BY IDNUM;

ERROR: BY variable IDNUM is not on input data set WORK.OLSEPS.
ERROR: BY variable IDNUM is not on input data set WORK.IDEPS.
NOTE: The SAS System stopped processing this step because of errors.
```

```
WARNING: The data set WORK.RCROSS may be incomplete.  When this step was stopped there were 0
         observations and 0 variables.
NOTE: The DATA statement used 0.17 seconds.
```



```
275   PROC SORT DATA=OLSEPS; BY FYAP;
ERROR: Variable FYAP not found.

NOTE: The SAS System stopped processing this step because of errors.
NOTE: The PROCEDURE SORT used 0.11 seconds.



276   PROC MEANS NOPRINT DATA=OLSEPS; BY FYAP;
ERROR: Variable FYAP not found.
277   VAR ORESID;
278   OUTPUT OUT=TIMEPS MEAN=TRESID;

NOTE: The SAS System stopped processing this step because of errors.
WARNING: The data set WORK.TIMEPS may be incomplete.  When this step was stopped there were 0
         observations and 0 variables.
NOTE: The PROCEDURE MEANS used 0.16 seconds.



279   PROC SORT DATA=RCROSS; BY FYAP;
ERROR: Variable FYAP not found.

NOTE: The SAS System stopped processing this step because of errors.
NOTE: The PROCEDURE SORT used 0.05 seconds.



280   DATA RBOTH; MERGE RCROSS TIMEPS; BY FYAP;

ERROR: BY variable FYAP is not on input data set WORK.RCROSS.
ERROR: BY variable FYAP is not on input data set WORK.TIMEPS.
NOTE: The SAS System stopped processing this step because of errors.
WARNING: The data set WORK.RBOTH may be incomplete.  When this step was stopped there were 0
         observations and 0 variables.
NOTE: The DATA statement used 0.17 seconds.



281   PROC SORT DATA=RBOTH; BY IDNUM FYAP;
ERROR: Variable IDNUM not found.
ERROR: Variable FYAP not found.

NOTE: The SAS System stopped processing this step because of errors.
NOTE: The PROCEDURE SORT used 0.11 seconds.
```

```
282   PROC REG;
283   MODEL HRS = TPH TPH2 PORESID TRESID;
ERROR: Variable HRS not found.
ERROR: Variable TPH not found.
ERROR: Variable TPH2 not found.
ERROR: Variable PORESID not found.
ERROR: Variable TRESID not found.
NOTE: The previous statement has been deleted.
284   T1: TEST PORESID;
ERROR: Variable PORESID not found.
NOTE: The previous statement has been deleted.
285   ****************************************************************;
286   *** ESTIMATING THE BETWEEN OFFICE MODEL FOR HAUSMANN TEST     ***;
287   *** NOTE THAT THE AVG.TREND VARIABLES ARE INCLUDED AS EACH    ***;
288   *** SITE HAS ITS OWN AVERAGE DEGREE OF TECHNICAL PROGRESS     ***;
289   *** THE ESTIMATED COFFICIENTS AND THE VARIANCE/COVARIANCE     ***;
290   *** MATRIX ARE SAVED FOR LATER CALCULATION OF HAUSMANN TEST   ***;
291   ****************************************************************;

NOTE: No variables in data set WORK.RBOTH.
NOTE: The PROCEDURE REG used 0.33 seconds.


292   PROC SORT DATA=OPER1; BY IDNUM;
ERROR: Variable IDNUM not found.

NOTE: The SAS System stopped processing this step because of errors.
NOTE: The PROCEDURE SORT used 0.11 seconds.



293   PROC MEANS NOPRINT; BY IDNUM;
ERROR: Variable IDNUM not found.
294   VAR HRS TPH TIME1 TIME2;
295   OUTPUT OUT=BTSET MEAN= HRS TPH TIME1 TIME2;

NOTE: The SAS System stopped processing this step because of errors.
WARNING: The data set WORK.BTSET may be incomplete.  When this step was stopped there were 0
         observations and 0 variables.
NOTE: The PROCEDURE MEANS used 0.17 seconds.



296   DATA BTSET; SET BTSET;
297   KEEP IDNUM HRS TPH TIME1 TIME2;

WARNING: The variable IDNUM in the DROP, KEEP, or RENAME list has never been referenced.
WARNING: The variable HRS in the DROP, KEEP, or RENAME list has never been referenced.
WARNING: The variable TPH in the DROP, KEEP, or RENAME list has never been referenced.
WARNING: The variable TIME1 in the DROP, KEEP, or RENAME list has never been referenced.
WARNING: The variable TIME2 in the DROP, KEEP, or RENAME list has never been referenced.
NOTE: The data set WORK.BTSET has 0 observations and 0 variables.
NOTE: The DATA statement used 0.22 seconds.
```

```
DATA BTREG; SET BTSET;
TPH2=TPH**2;
TIME22=TIME2**2;
TIME12=TIME1**2;
TIM1TPH=TIME1*TPH;
TIM2TPH=TIME2*TPH;

NOTE: Variable TPH is uninitialized.
NOTE: Variable TIME2 is uninitialized.
NOTE: Variable TIME1 is uninitialized.
NOTE: The data set WORK.BTREG has 0 observations and 8 variables.
NOTE: The DATA statement used 0.27 seconds.


PROC REG DATA=BTREG OUTEST=BTWCOV COVOUT;
MODEL HRS=TPH TPH2 TIM1TPH
ERROR: Variable HRS not found.
          TIME1 TIME12 TIM2TPH TIME2 TIME22;
NOTE: The previous statement has been deleted.

NOTE: No observations in data set WORK.BTREG.
NOTE: The data set WORK.BTWCOV has 0 observations and 0 variables.
NOTE: The PROCEDURE REG used 0.16 seconds.


PROC PRINT DATA=BTWCOV;

NOTE: No variables in data set WORK.BTWCOV.
NOTE: The PROCEDURE PRINT used 0.11 seconds.


DATA BTWCOV; SET BTWCOV;
KEEP TPH TPH2 TIM1TPH
     TIME1 TIME12 TIM2TPH TIME2 TIME22;
;
*%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%;
* PART IV USING PROC IML TO  ESTIMATE THE FIXED EFFECTS MODEL     ;
* WITHOUT AN AUTOCORRELATION CORRECTION. USING THE RESIDUALS       ;
* FROM THAT MODEL FOR CALULATING THE BFN DURBIN WATSON AND THE     ;
* BLI SERIAL CORRELATION PARAMETER (RHO)                           ;
*%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%;
***** START OF PROC IML *******;

WARNING: The variable TPH in the DROP, KEEP, or RENAME list has never been referenced.
WARNING: The variable TPH2 in the DROP, KEEP, or RENAME list has never been referenced.
WARNING: The variable TIM1TPH in the DROP, KEEP, or RENAME list has never been referenced.
WARNING: The variable TIME1 in the DROP, KEEP, or RENAME list has never been referenced.
WARNING: The variable TIME12 in the DROP, KEEP, or RENAME list has never been referenced.
WARNING: The variable TIM2TPH in the DROP, KEEP, or RENAME list has never been referenced.
WARNING: The variable TIME2 in the DROP, KEEP, or RENAME list has never been referenced.
WARNING: The variable TIME22 in the DROP, KEEP, or RENAME list has never been referenced.
NOTE: The data set WORK.BTWCOV has 0 observations and 0 variables.
NOTE: The DATA statement used 0.48 seconds.
```

```
319   PROC IML;
IML Ready
320   SHOW SPACE;
321   RESET AUTONAME ;
322
323   START MAIN;
324     USE NOUT VAR {N};
324                              * READING IN THE # OF OBS PER SITE;
325     READ ALL INTO NN ;
325                              * N IS NUMBER OF TIME PERIOD PER P.O.;
326    * READING IN THE DATA FOR RHS VARIABLES;
327     USE OPER1 VAR
328    {IDNUM TPH TPH2 TIM1TPH TIME1 TIME12
329   TIM2TPH TIME2 TIME22 AP02 AP03 AP04 AP05 AP06 AP07
330   AP08 AP09 AP10 AP11 AP12 AP13 TPH1 TPH21 };
331     READ ALL INTO Z ;
331                              * READING IN THE DATA FOR THE DEP VAR;
332     USE OPER1 VAR  {HRS};
333     READ ALL INTO Y ;
334     NT= NROW(Y);
334                                   *NT IS TOTAL NUMBER OF OBS.;
335     N=NROW(NN);
336     NTS=NT;
336             NTS1=NTS+1;
337     K1=NCOL(Z);
338     X= Z(|,2:K1|);
338                                     * X MATRIX HAS NO INTERCEPT;
339     K= NCOL(X);
340     N= NROW(NN);
340                                     * N IS TOTAL NUMBER OF SITES;
341     N1=N+{1};
342     DFE = NTS - N -K;
343     XDX= J(K,K,{0});
344     XDY= J(K,1,{0});
345     DX= J(1,K,{0});
345                                  * INITIALIZING THE PLACE HOLDERS;
346     DY= J(1,1,{0});
347     I1={0};
348     I2={0};
349     DO S={1} TO N BY{ 1};
350        T = NN(|S,|);
350                                  * NUMBER OF OBS FOR SITE i;
351        I1={ 1}+I2;
351                                  * IDENTIFYING THE 1ST OBS FOR SITE i;
352        I2=T+I2;
352                                  * IDENTIFYING THE LAST OBS FOR SITE i;
353        X1= X(|I1:I2,|);
353                                  * ISOLATING SITE i'S DATA;
354        Y1= Y(|I1:I2,|);
355        JT1 = J(T,1,{1});
356        IT= I(T);
357        D = IT - JT1*JT1`/T;
```

```
357                                  * REMOVING THE SITE SPECIFIC EFFECTS;
358       DX1=D*X1;
359       DY1=D*Y1;
360       XDX=XDX+X1`*DX1;
361       XDY=XDY+X1`*DY1;
362       DX=DX//DX1;
362                                   * VERTICALLY CONCATINATING THE DATA;
363       DY=DY//DY1;
364       END;
365    DX= DX(|2:NTS1,|);
365                                   * ELIMINATING THE PLACEHOLDER OBS;
366    DY= DY(|2:NTS1,|);
367    B_F= SOLVE(XDX,XDY);
367                          * FIXED EFFECTS ESTIMATOR;
367                                                B_F=INV(XDX)*XDY ;
368    RES_F = DY - DX*B_F;
368                          * FIXED EFFECTS RESIDUALS;
369    SSE_F = RES_F`*RES_F;
369                          * FIXED EFFECTS SUM OF SQUARED ERR;
370    S2 = SSE_F/DFE;
370                          * FIXED EFFECTS REGRESSION VARIANCE;
371    SER= SQRT(S2);
371                          * FIXED EFFECTS STD ERROR OF THE REGRESSION;
372    VCV = INV(XDX) # S2;
372                          * FIXED EFFECTS VAR/COVAR MATRIX;
373    YBAR = Y(|+,|)/NTS;
373                          * CALCULATNG PSUEDO R2;
374    YDEV = Y - YBAR;
375    YSQR = YDEV`*YDEV;
376    R2   = {1} - ((SSE_F)/YSQR);
377    STD_F= SQRT(VECDIAG(S2* INV(XDX)));
377                                       * CALCULATES STD ERR OF ESTIM.;
378   TTEST_F= B_F/STD_F;
378                                       * T-STAT OF COEFFICIENTS;
379    B_FIXED= B_F||TTEST_F;
380    NK1 = N*K1;
381    ************************************************************************;
382    *** CALCULATING THE BFN DW AND THE BALTAGI-LI RHO                    ***;
383    *** THESE CALCULATIONS REQUIRE FIRST IDENTIFYING THE RESIDUALS       ***;
384    *** BY SITE AND THEN CREATING A SET OF LAGGED RESIDUALS BY SITE      ***;
385    *** FINALLY THE CURRENT AND LAGGED RESIDUALS ARE PUT INTO THE        ***;
386    *** APPROPRIATE FORMULAS                                            ***;
387    ************************************************************************;
388    R=RES_F;
389    BIFR=J(1,1,0);
389                      * CREATING PLACEHOLDER MATRICES;
390    BCUR=J(1,1,0);
391    BLAG=J(1,1,0);
392    BN1=0;
393    BN2=0;
394    DO S=1 TO N BY 1;
394                          * IDENTIFYING THE RESIDUALS BY SITE;
395    BL=NN(|S,|)-1;
395                          * SETTING THE RESIDUAL VECTOR SIZE;
```

```
396     BN1=1+BN2;
397     BN2=BL+BN2;
398     BND1=BN1+1;
399     BND2=BN2-1;
400     BR1=R(|BND1:BN2,|);
400                           * CREATING THE VECTOR OF CURRENT RESIDUALS;
401     LB1=R(|BN1:BND2,|);
401                           * CREATING THE VECTOR OF LAGGED RESIDUALS;
402     BIFR1=BR1-LB1;
402                           * CREATING THE VECTOR OF DIFFERENCE RESIDUALS;
403     BCUR1=BR1;
404     BLAG1=LB1;
405     BIFR=BIFR//BIFR1;
405                            *CONCATINATING THE RESIDUAL VECTORS;
406     BCUR=BCUR//BCUR1;
407     BLAG=BLAG//BLAG1;
408     END;
409     BIFR=BIFR;
410     BCUR=BCUR;
411     BLAG=BLAG;
412     BCURLAG=BCUR`*BLAG;
413     SMSQBF=BIFR`*BIFR;
414     BFN=SMSQBF/SSE_F;
414                                 * CALCULATING THE BFN & BLI STATISTICS;
415     BLI=BCURLAG/(BLAG`*BLAG);
416     ************************************************************;
417     *** END OF BFN/BLI CALCULATION                            ***;
418     *** CREATE OUTPUT SET FOR BLI STATISTIC                   ***;
419     ************************************************************;
420     VARN2={'BLI'};
421     CREATE BLIOUT FROM BLI (|COLNAME=VARN2|);
422     APPEND FROM BLI;
423     SETOUT BLIOUT;
424     CLOSE BLIOUT;
425     ************************************************************;
426     *** CALCULATING THE HAUSMAN H STATISTIC                   ***;
427     ************************************************************;
428     USE BTWCOV VAR{TPH TPH2 TIM1TPH
429                    TIME1 TIME12 TIM2TPH TIME2 TIME22};
430     READ ALL INTO BTW;
431     BB = BTW(|1,|);
432     BTCV = BTW(|3:10,|);
433     BF = B_F(|1:8,|);
434     FCV = VCV(|1:8,1:8|);
435     H1 = BF`-BB;
436     H2 = INV(FCV + BTCV);
437     H3 = BF - BB`;
438     H = H1 * H2 * H3;
439     ********** PRINTING OF OUTPUT ****************************;
440     RF={  'TPH' 'TPH2' 'TIME1TP'
441           'TIME1' 'TIME12' 'TIME2TP' 'TIME2' 'TIME22'
442    'AP02' 'AP03' 'AP04' 'AP05' 'AP06' 'AP07' 'AP08' 'AP09'
443    'AP10' 'AP11' 'AP12' 'AP13'
444           'TPH(-1)' 'TPH2(-1'};
```

```
445     PRINT N ;
446     PRINT B_FIXED(| ROWNAME=RF|);
447     PRINT R2, S2, SER, NT, NTS, BFN;
448     PRINT BLI;
449     PRINT H;
450   FINISH MAIN;
NOTE: Module MAIN defined.
451   RUN MAIN;
WARNING: Data set WORK.NOUT is empty.

 statement : USE              at line   324 column   4
 traceback : module MAIN      at line   324 column   4
WARNING: End of File reached.

 statement : READ             at line   325 column   4
 traceback : module MAIN      at line   325 column   4
WARNING: Data set WORK.OPER1 is empty.
ERROR: Variable IDNUM is not on file WORK.OPER1.

 statement : USE              at line   327 column   4
 traceback : module MAIN      at line   327 column   4
NOTE: Paused in module MAIN.
Exiting IML.
NOTE: The PROCEDURE IML used 2.79 seconds.


452    DATA OPER1; SET OPER1;
453    INT=1;

NOTE: The data set WORK.OPER1 has 0 observations and 16 variables.
NOTE: The DATA statement used 0.17 seconds.


454    DATA COUNT; SET OPER1;

NOTE: The data set WORK.COUNT has 0 observations and 16 variables.
NOTE: The DATA statement used 0.11 seconds.


455    PROC MEANS NOPRINT;
456    BY IDNUM;
ERROR: Variable IDNUM not found.
457    VAR TPH;
458    OUTPUT OUT=NOUT N=N;

NOTE: The SAS System stopped processing this step because of errors.
WARNING: The data set WORK.NOUT may be incomplete.  When this step was stopped there were 0
         observations and 0 variables.
WARNING: Data set WORK.NOUT was not replaced because this step was stopped.
NOTE: The PROCEDURE MEANS used 0.16 seconds.


459    PROC DATASETS LIBRARY=WORK;
```

```
-----Directory-----

Libref:         WORK
Engine:         V612
Physical Name: C:\SAS\SASWORK\#TD91087
```

#	Name	Memtype	Indexes
1	BTREG	DATA	
2	BTSET	DATA	
3	BTWCOV	DATA	
4	COUNT	DATA	
5	IDEPS	DATA	
6	NOUT	DATA	
7	OLSEPS	DATA	
8	OPER1	DATA	
9	RBOTH	DATA	
10	RCROSS	DATA	
11	TIMEPS	DATA	

```
 DELETE COUNT;
   ;
*%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%;
* PART V: ESTIMATING THE FIXED EFFECTS MODEL WITH THE SERIAL        ;
* CORRELATION CORRECTION IN PLACE. THE TRANSFORMATION IS DIFFERENT  ;
* FOR THE FIRST OBSERVATION FOR EACH SITE THAN THE REMAINING        ;
* OBSERVATIONS                                                      ;
*%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%;
*****************************************************************;
***    RE-ENTER PROC IML AND USE BLI RHO FOR SERIAL CORRELATION ***;
***    CORRECTION IN PLACE. THE FIRST LINE IS USED TO ENSURE    ***;
***    THERE IS ENOUGH SPACE TO  ESTIMATE EQUATIONS             ***;
*****************************************************************;

NOTE: Deleting WORK.COUNT (memtype=DATA).
NOTE: The PROCEDURE DATASETS used 0.55 seconds.


 PROC IML SYMSIZE=600000 WORKSIZE=6000000;
NOTE: Assuming that the number is given in bytes and not kilobytes.
NOTE: Assuming that the number is given in bytes and not kilobytes.
Worksize    = 6000000
Symbol size = 600000
IML Ready
 SHOW SPACE;
 RESET AUTONAME;
 START MAIN;
 USE NOUT VAR {N};
                          * READING IN THE # OF OBS PER SITE;
 READ ALL INTO NN;
                          * N IS THE NUMBER OF TIME PERIODS PER SITE;
*READING IN THE DATA FOR THE RHS VARIABLES;
 USE OPER1 VAR
{INT TPH TPH2 TIM1TPH
     TIME1 TIME12 TIM2TPH TIME2 TIME22 AP02 AP03
```

```
483        AP04 AP05 AP06 AP07 AP08 AP09 AP10
484        AP11 AP12 AP13 TPH1 TPH21};
485    READ ALL INTO Z;
485                                * READING IN THE ESIMATED RHO;
486    USE BLIOUT VAR {BLI};
487    READ ALL INTO BLI;
488    USE OPER1 VAR {HRS};
488                              * READING IN THE DEPENDENT VARIABLE;
489    READ ALL INTO Y;
490    ************************************************************;
491    *** THIS SECTION PROVIDES THE TRANSFORMATION OF THE DATA     ;
492    *** THAT IS USED IN THE SERIAL CORRELATION CORRECTION        ;
493    ************************************************************;
494    OB1=(1-BLI**2)**.5;
494                               *CONSTRUCTING THE TRANSFORMATION FOR 1ST OB;
495    K1=NCOL(Z);
496    NT=NROW(Y);
496                                *NT IS THE TOTAL NUMBER OF OBSERVATIONS;
497    N=NROW(NN);
497                              *N IS THE TOTAL NUMBER OF SITES;
498    TRZ=J(1,K1,{0});
498                                *CONSTRUCTING THE PLACEHOLDER MATRICES;
499    TRY=J(1,1,{0});
500    IN1=0;
501    IN2=0;
502    DO S=1 TO N BY 1;
502                         *IDENTIFYING THE OBSERVATIONS FOR THE jTH SITE;
503    TL=NN(|S,|);
504    IN1 = 1 + IN2;
504                         * CREATING BOUNDS FOR CURRENT AND LAGGED VECTORS;
505    IN2 = TL + IN2;
506    INYD1 = IN1 + 1;
507    INYD2 = IN2 - 1;
508    FRST  = Z(|IN1,|);
508                              * IDENTIFYING THE FIRST OB. FOR SITE J;
509    OTHER = Z(|INYD1:IN2,|);
509                              * IDENTIFYING THE SECOND THROUGH LAST OBS
510                                FOR SITE J;
511    LAGOB = Z(|IN1:INYD2,|);
511                              * IDENTIFYING THE VECTOR OF LAG OBSERVATIONS
512                                FOR SITE J;
513    FRSTY = Y(|IN1,|);
514    OTHEY = Y(|INYD1:IN2,|);
515    LAGY  = Y(|IN1:INYD2,|);
516    FRST1 = FRST  * OB1;
516                             * TRANSFORMING THE 1ST OBS FOR RHS VARIABLES;
517    FRSTY1= FRSTY * OB1;
517                             * TRANSFORMING THE 1ST OBS FOR LHS VARIABLE ;
518    OTHER1= OTHER(|,1|) * (1-BLI);
518                                      * TRANSFORMING INTERCEPT TERM;
519    OTHER2= OTHER(|,2:K1|)-(BLI*LAGOB(|,2:K1|));
519                                                  * TRANSFORMING THE;
520                                                  * NON-INTERCEPT RHS;
521                                                  * VARIABLES;
```

```
522   OTHER3= OTHER1||OTHER2;
522                              * CONCATINATING INTER.AND NON-INTERCEPT ;
523   OTHEY1= OTHEY - (BLI*LAGY);
523                              * TRANSFORM THE LHS VARIABLE;
524   TRZ1=FRST1//OTHER3;
524                               * VERTICALLY CONCATINATING THE DATA FOR SITE j;
525   TRY1=FRSTY1//OTHEY1;
526   TRZ =TRZ//TRZ1;
526                         *VERTICALLY CONCATINATING THE DATA FOR ALL SITES;
527   TRY =TRY//TRY1;
528   END;
529   NTS=NT;
530   NTS1=NTS+1;
531   TRZ=TRZ(|2:NTS1,|);
531                              *REMOVE PLACEHOLDER OBSERVATION;
532   TRY=TRY(|2:NTS1,|);
533   Z=TRZ;
533                              *REDEFINE MATRICES FOR ESTIMATION ;
534   Y=TRY;
535   FREE TRZ TRY TRZ1 TRY1 FRST1 FRSTY1 OTHER3 OTHEY1 OTHER2 OTHER3;
536     K1=NCOL(Z);
537     NTS= NROW(Y);
537                        *NTS IS THE TOTAL NUMBER OF OBS AFTER TRANSFORMATION;
538     X= Z(|,2:K1|);
538                         * X MATRIX HAS NO INTERCEPT;
539     K= NCOL(X);
540     N1=N+{1};
541     DFE = NTS - N -K;
542     XDX= J(K,K,{0});
542                          *INITIALIZING PLACE HOLDER MATRICES FOR REGRESSION;
543     XDY= J(K,1,{0});
544     DX= J(1,K,{0});
545     DY= J(1,1,{0});
546     I1={0};
547     I2={0};
548   * THIS SECTION IDENTIFIES THE DATA FOR EACH SITE j;
549     DO S={1} TO N BY{ 1};
550        T = NN(|S,|);
550                           * T IS THE # OF OBS FOR SITE j AFTER TRANSFORM;
551        I1={ 1}+I2;
551                           * IDENTIFYING THE 1ST OBS FOR SITE j;
552        I2=T+I2;
552                           * IDENFIFYING THE LAST OBS FOR SITE j;
553        X1= X(|I1:I2,|);
553                           * ISOLATING THE DATA FOR SITE j;
554        Y1= Y(|I1:I2,|);
555        JT1 = J(T,1,{1});
556        IT= I(T);
557        D = IT - JT1*JT1`/T;
557                                    * REMOVING THE SITE SPECIFIC EFFECTS;
558        DX1=D*X1;
559        DY1=D*Y1;
560        XDX=XDX+X1`*DX1;
561        XDY=XDY+X1`*DY1;
```

```
562         DX=DX//DX1;
562                              *VERTICALLY CONCATINATING THE DATA;
563         DY=DY//DY1;
564         END;
565       DX= DX(|2:NTS,|);
565                              * ELIMINATING THE PLACEHOLDER OBSERVATION;
566       DY= DY(|2:NTS,|);
567       B_F= SOLVE(XDX,XDY);
567                              * FIXED EFFECTS ETIMATOR: B_F=INV(XDX)*XDY;
568       RES_F = DY - DX*B_F;
568                              * FIXED EFFECTS RESIDUALS ;
569       SSE_F = RES_F`*RES_F;
569                              * FIXED EFFECTS SUM OF SQUARED ERROR;
570       S2    = SSE_F/DFE;
570                              * FIXED EFFECTS REGRESSION VARIANCE;
571       SER   = SQRT(S2);
571                              * FIXED EFFECTS STD ERROR OF THE REGRESSION;
572       VCV = INV(XDX)# S2;
572                              * FIXED EFFECTS VAR/COVAR MATRIX;
573       STD_F= SQRT( VECDIAG(S2* INV(XDX)));
573                                             * CALCULATING THE STD ERR OF
574                                                  ESTIMATES;
575       TTEST_F= B_F/STD_F;
575                                             * T-STAT OF COEFFICIENTS;
576       B_FIXED= B_F||TTEST_F;
577       NK1 = N*K1;
578       RF={'TPH' 'TPH2' 'TIME1TPH'
579           'TIME1' 'TIME12' 'TIME2TPH' 'TIME2' 'TIME22'
580           'AP02' 'AP03' 'AP04' 'AP05' 'AP06' 'AP07' 'AP08'
581           'AP09' 'AP10' 'AP11' 'AP12' 'AP13'
582           'TPH(-1)' 'TPH2(-1)'};
583     ** PRINTING OUT THE RESULTS ***:
584       PRINT N;
585       PRINT B_FIXED(| ROWNAME=RF|);
586       PRINT S2, SER, NTS, N;
587       PRINT VCV;
588     FINISH MAIN;
NOTE: Module MAIN defined.
589
590     RUN MAIN;
WARNING: Data set WORK.NOUT is empty.

 statement : USE             at line   477 column   3
 traceback : module MAIN     at line   477 column   3
WARNING: End of File reached.

 statement : READ            at line   478 column   3
 traceback : module MAIN     at line   478 column   3
WARNING: Data set WORK.OPER1 is empty.
ERROR: Variable AP02 is not on file WORK.OPER1.

 statement : USE             at line   480 column   3
 traceback : module MAIN     at line   480 column   3
NOTE: Paused in module MAIN.
```

```
591    ************************************;
592    **    END OF PROGRAM    **;
```

SPBS PRIORITY OPERATIONS/ HOURS ON TPH
USING ONLY CONTINUOUS DATA FROM 8801-9613
INCLUDING OFFICES @ LEAST 39 OBS/LAG MODEL
USES 12 AP DUMMIES TO CAPTURE SEASONAL EFFECTS

Attachment 5
Page 1 of 2
to OCA/USPS-119

08:50 Friday, November 14, 1997

Memory Usage (in bytes):

Symbol Space		Size 131056	Available 130032
Extent	1	Size 131056	Available 131032

Number of compresses = 0

Memory Usage (in bytes):

Symbol	Space	Size 600000	Available 598976
Extent	1	Size 6000000	Available 5999976

Number of compresses = 0

CERTIFICATE OF SERVICE

I hereby certify that I have this date served the foregoing document upon all participants of record in this proceeding in accordance with section 12 of the rules of practice.

Kenneth E. Richardson

KENNETH E. RICHARDSON
Attorney

Washington, D.C. 20268-0001
November 14, 1997